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Notes on the Flora of Block Island.

By W. W. Bailey.

It had always been my ambition to botanize an island. I have envied Crusoe his leisure and opportunity. The possibility of compassing such a task commends it to the ambitious; one does not, as on a continent, feel appalled by the vast extent of the field. It seems a mere matter of faithful unremitting labor.

The island is of peculiar construction, indeed a vast terminal moraine. There is no rock *in situ*, but only a multitudinous mass of bowlders, pebbles, sand and clay. The bowlders are of various formation, many of them erratic from a long distance. Black magnetic sand is common on the beach. Some of the springs are strongly impregnated with iron. The island, viewed from Beacon Hill, looks like a petrified sea. It presents a most surprising undulating surface, and almost every valley or depression holds a pond or bog.

The cliffs of the south shore are very wonderful. Here we obtain a natural section and can view the strata, for rain, frost, and the action of the sea have denuded the land. I was often reminded of scenes in Nevada.

The mass of the bluff is of pure clay of a pale slate color. Over this is a loose deposit of bowlders and pebbles; over these again the loam. The cliffs, if one may so call them, have weathered into most fanciful shapes; minarets, towers, pinnacles, are piled up at random. Often a huge bowlder has lost its bedding and been hurled into the abyss. Again, one will be noticed poised too perilously near the brink; it is a mere question of time

when it falls. On the most prominent bluff of all stands the south-east lighthouse. The keepers assured us that the sea was surely encroaching on the land.

I have never seen so changeable a shore. On one day the beach would be firm, hard sand; the next a mass of rattling pebbles. One could scarcely believe it was the same place.

The bogs and pond holes had a perennial fascination for me. There are said to be some three hundred on the island, and I can well believe it. They are filled with pond lilies, and surely there is no place in the world where they are finer. Occasionally a pink one turns up.

About these pond-holes grow, in the peat, a great variety of interesting plants. Two species of sundew were found, the *Drosera rotundifolia*, and *D. intermedia* var. *Americana*. *Rhexia Virginica* was common. I never before saw so much of the ragged orchis (*Habenaria lacera*). Everywhere the swamp loose-strife, *Decodon*, was abundant. Here, too, could be seen quantities of *Iris versicolor*, three *Eriophorums*, cat-tails, sedges and grasses.

The prevailing shrub in the swamps was *Cephalanthus occidentalis*. In smaller quantities grew *Rosa Carolina*, and *Clethra alnifolia*. We found one bush only of what appeared to be *Ilex lævigata*. Willows were by no means common, and no species of *Alnus* was seen at all. Think of growing up without a knowledge of alder-tags! Trees of any sort are extremely scarce. Those there are, appear, with rare exceptions, to have been planted. Mr. J. F. Collins and myself, however, found a few small tupeloes, *Nyssa aquatica*. White poplars are the trees most cultivated. I saw besides a few *Ailanthus* trees and locusts. Protected apple-orchards do well. I found also one lone and stunted hickory. There is no sign anywhere of a conifer. Here and there one meets with good clumps of bayberry (*Myrica cerifera*), but *Comptonia* was not seen at all.

On the whole the flora, considering the situation, seemed to me very rich. We identified 294 species of plants and have some dozen or more things yet to determine. Then, too, the early season no doubt would reveal many things, while we lost nearly all the *Asters;* I think there are probably six or eight of these.

The region might well be mapped out into districts, as, of the

bogs, the many fresh ponds, the Great Salt Pond, the meadows, the cliffs, and the shore. One might, indeed, include another province, in the range of the Algæ, these, however, from the changeable nature of the shore, are not so abundant as in many places along our coasts. Still we found glorious specimens of *Ascophyllum*, *Fucus*, and *Laminaria*.

Near the beach, of course, one finds *Anagallis arvensis*, a cosmopolitan plant. Here, too, are *Cakile edentula;* the curious sea-sand-wort, *Arenaria peploides;* sow thistle, *Sonchus asper; Suæda*, *Salsola*, and *Solidago sempervirens*. The last grows magnificently, but was hardly in flower even when I left. I found in all seven species of golden-rod on the island, as will be seen by the appended list. *Solidago lanceolata* is, I think, the commonest weed on the island. It covers whole pastures and fringes every road. In some places the *S. Caroliniana* was about as common. We noticed quite a difference in the time of flowering of the two species, the last preceding the *S. lanceolata* by perhaps a week.

There is the usual host of weeds, among which the wild carrot is preëminently first. *Chrysanthemum Leucanthemum*, is a good second. Now and then one meets with a clump of *Rudbeckia hirta*. It is misnamed "ox-eye" throughout Rhode Island. There were four species of thistle, the "Canada" being well to the front.

My habit was to jot down in a note book, as I walked, whatever plants I saw, the walk being mainly for the special purpose of discovery. I also collected somewhat. For one week, long to be remembered by us both, I had the assistance of my young friend, Mr. J. F. Collins, of Providence.

Incidentally we observed the butterflies, finding, to our surprise, a large number of specimens of *Janonia cœnia*. Hitherto it has been only sporadically found in the State. The abundance of *Papilio Asterias* is explained from the prevalence of Umbelliferæ. The carrot and *Sium cicutæfolium* are everywhere. Nothing umbelliferous probably ever escapes the larva of *Asterias*, though I never happened to see it on *Discopleura*, so frequent here. *Danais Archippus* had found out that *Asclepias Syriaca* was here and hung his green and gold chrysalis on the leaves.

Among the plants new to Rhode Island, we found *Potamogeton*

pulcher, and *Gaylussacia dumosa*, var. *hirtella*. There are seven ferns on our list, among them *Woodwardia areolata*. Although we found only its barren frond, we feel quite sure that no *Onoclea* deceived us. The two can be discriminated when placed side by side; we saw no *Pteris aquilina*. There were several *Equisetums*, and a number of mosses and lichens. Not a single plant of the lily family presented itself. This seems peculiar. One might at least expect some *Smilacina*. Among the orchids, besides the "ragged" already mentioned, we had *Gyrostachys præcox*, *G. simplex* and *G. gracilis*.

I have spoken of the total absence of Liliaceæ. It is curious to notice this non-appearance of the commonest plants of the main land. Thus, there were no *Lespedezas*, *Meibomias*, nor *Baptisias*. Not a specimen of *Hibiscus Moscheutos* was seen, nor any of the gentians, nor *Sabbatias;* Gentianaceæ are represented by *Limnanthemum* and *Menyanthes*. *Elatine Americana* was abundant in and around Sands, Pond. *Sagina procumbens* formed verdant clumps about the little springs on the cliffs. *Linum striatum* was abundant in the swamps. I saw no true *Geranium*, but the family Geraniaceæ was represented by *Oxalis corniculata* var. *stricta*, and by *Impatiens biflora*. *Ampelopsis quinquefolia* was so uncommon as to be called rare. *Rhus radicans*, while not so common as on the mainland, was far too abundant. *Rhus venenata* was not seen at all, though many localities seemed favorable for it. *Polygala polygama*, and *P. viridescens* were common. There were no Lupines nor *Cassias*, but *Lathyrus maritimus* throve on the southern cliffs, and we found also the genera *Phaseolus*, *Medicago* and *Trifolium*. Among the clovers was *Trifolium hybridum*, now seen everywhere in New England.

Rosaceæ were represented by *Spiræa tomentosa* and *S. salicifolia*, *Prunus maritima*, several species of *Rubus*, *Fragaria vesca*, the usual weedy *Potentillas*, and *Rosa Carolina*. The last formed quite abundant copses. We saw no Saxifragaceæ, which seems a little odd. I expected *Parnassia* at least. *Myriophyllum pinnatum*, was found in especially fine condition. Among Compositæ was the camphor-weed, *Pluchea camphorata*, growing with unusual vigor. To me it smells of anything but camphor. I was surprised to find *Cichorium Intybus* well established. As a rule, it is somewhat

local in Rhode Island, and does not make itself at home as in Eastern Massachussetts. It is, with its large, deep-blue heads, a highly ornamental nuisance. I saw but one *Lobelia*, the common Indian tobacco, *L. inflata*. Among Primulaceæ I was glad to find a fine bed of *Samolus*. It grows in the sand near the Great Salt Pond.

The Labiatæ were represented by eleven genera and thirteen species—a good showing—among them was *Melissa officinalis*. *Polygonum* was another genus with full ranks. We recorded eight species. The surprising height of some plants was noticeable; thus some *Sparganiums* and *Sagittarias* were the giants of their race. I have a list of 28 grasses, and am sure that a number more might be found. Both Mr. Collins and myself rigorously excluded everything from our catalogue of which we had any lingering doubt.

I found myself speculating much, and perhaps wildly, as to the origin and remote history of these insular plants. How came they here? Are they in some cases descendants of old continental forms existing while yet Block Island was part of the mainland? On the other hand, did birds, winds, tide-currents, or the operations of man introduce them? Of course we can account for the presence of grasses and weeds. But how about the endemic species? The flora seems to me pretty full for the situation. Those who consult the following list will be struck by its length and by the curious lacunæ.

A List of Plants found on Block Island, R. I., in July and August.

By W. W. Bailey and J. F. Collins.

(From July 19th to end of August, 1892.)

RANUNCULACEÆ.

1. *Ranunculus Cymbalaria*, Pursh. Abundant about the Great Salt Pond, Aug.
2. *Ranunculus repens*, L.
3. *Ranunculus acris*, L.

NYMPHÆACEÆ.

4. *Castalia odorata* (Dryand.) Woodv. and Wood. Extremely abundant in nearly all the numerous fresh water ponds. Flowers in some instances measuring from 7 to 9 inches in diameter. Occasionally pink.
5. *Nymphæa advena* (Soland.), Greene. Quite common.

CRUCIFERÆ.

6. *Alyssum maritimum*, L. About yards. Barely Escaped.
7. *Nasturtium officinale*, R. Br. Abundant about springs. East side.
8. *Sisymbrium officinale* (L.) Scop.
9. *Brassica Sinapistrum*, Boiss.
10. *Brassica alba* (L.) Boiss.
11. *Brassica nigra* (L.) Koch.
12. *Brassica campestris*, L.
13. *Bursa pastoris* (L.) Weber.
14. *Lepidium Virginicum*, L.
15. *Cakile edentula* (Bigel.) Hook. Very common on sea beaches.
16. *Raphanus Raphanistrum*, L.

CISTACEÆ.

17. *Helianthemum majus* (L.) B. S. P.

VIOLACEÆ.

18. *Viola obliqua*, Hill.
19. *Viola sagittata*, Ait.
20. *Viola primulæfolia*, L.
21. *Viola lanceolata*, L. The violets were, of course, all out of flower.

CARYOPHYLLACEÆ.

22. *Dianthus Armeria*, L.
23. *Saponaria officinalis*, L.
24. *Arenaria serpyllifolia*, L.
25. *Arenaria peploides*, L. In occasional large patches on the beaches.
26. *Alsine media*, L.
27. *Cerastium vulgatum*, L.
28. *Sagina procumbens*, L. Springs on south cliffs.
29. *Tissa rubra* (L.) Britton.
30. *Tissa marina* (L.) Britton.
31. *Spergula arvensis*, L.

PORTULACACEÆ.

32. *Portulaca oleracea*, L.

ELATINACEÆ.

33. *Elatine Americana* (Pursh.) Arn. Borders of Sands Pond. Common.

HYPERICACEÆ.

34. *Hypericum perforatum*, L.
35. *Hypericum maculatum*, Walt.
36. *Hypericum mutilum*, L.
37. *Hypericum gentianoides* (L.) B. S. P.
38. *Elodes Virginica* (L.) Nutt.

MALVACEÆ.

39. *Malva rotundifolia*, L.
40. *Abutilon Avicennæ*, Gærtn.

LINACEÆ.

41. *Linum striatum*, Walt. Very common in the bogs. July.
42. *Linum usitatissimum*, L.

GERANIEÆ.

43. *Oxalis corniculata*, L., Var. *stricta* (L.) Sav.
44. *Impatiens biflora*, Walt.

ILICINEÆ.

45. *Ilex lævigata* (Pursh.) A. Gray.

VITACEÆ.

46. *Vitis Labrusca*, L.
47. *Ampelopsis quinquefolia* (L.) Michx. Quite rare.

ANACARDIACEÆ.

48. *Rhus copallina*, L.
49. *Rhus radicans*, L.

POLYGALACEÆ.

50. *Polygala viridescens*, L.
51. *Polygala polygama*, Walt.

LEGUMINOSÆ.

52. *Trifolium arvense*, L.
53. *Trifolium pratense*, L.
54. *Trifolium repens*, L.
55. *Trifolium hybridum*, L.
56. *Melilotus alba*, Lam.
57. *Medicago sativa*, L. Scarce.
58. *Robinia pseudacacia*, L. Occasional about houses.
59. *Lathyrus maritimus* (L.) Bigel. Common on the beaches and bluffs.
60. *Apios tuberosa*, Mœnch. Occasional.
61. *Phaseolus helvolus*, L. Occasional.

ROSACEÆ.

62. *Prunus maritima*, Wang. Common.
63. *Prunus Virginiana*, L. A few specimens only.
64. *Spiræa salicifolia*, L. Occasional.
65. *Spiræa tomentosa*, L. Occasional.
66. *Rubus occidentalis*, L.
67. *Rubus villosus*, Ait.
68. *Rubus Canadensis*, L.
69. *Rubus hispidus*, L.
70. *Fragaria vesca*, L. Common.
71. *Potentilla Norvegica*, L.
72. *Potentilla argentea*, L.
73. *Potentilla Canadensis*, L.
74. *Rosa Carolina*, L.
75. *Rosa lucida*, Ehrh.
76. *Pyrus arbutifolia* (L.) L. f. Rare.

DROSERACEÆ.

77. *Drosera rotundifolia*, L. Very common.
78. *Drosera intermedia*, Hayne, Var. *Americana*, D. C. Very common.

HALORAGEÆ.

79. *Myriophyllum pinnatum* (Walt.) B. S. P. Common.
80. *Proserpinaca palustris*, L. Common.
81. *Callitriche verna*, L.

MELASTOMACEÆ.

82. *Rhexia Virginica*, L. Very common.

LYTHRACEÆ.

83. *Decodon verticillatus* (L.) Ell. Very abundant.

ONAGRACEAE.

84. *Ludwigia palustris* (L.) Ell. Common.
85. *Epilobium lineare*, Muhl.
86. *Epilobium coloratum*, Muhl.
87. *Epilobium adenocaulon*, Haussk. The most common species.
88. *Œnothera biennis*, L.

FICOIDEÆ.

89. *Mollugo verticillata*, L.

UMBELLIFERÆ.

90. *Daucus Carota*, L. The most common weed.
91. *Heracleum lanatum*, Michx. Southern cliffs.
92. *Sium cicutaefolium*, Gmelin. Very abundant.
93. *Cicuta maculata*, L. Occasional.
94. *Discopleura capillacea*, D. C. Very abundant.

CORNACEÆ.

95. *Nyssa aquatica*, L. A very few scattered trees in a sheltered valley.

CAPRIFOLIACEÆ.

96. *Sambucus Canadensis*, L. Rather frequent.
97. *Viburnum molle*, Michx. A few specimens only.

RUBIACEÆ.

98. *Cephalanthus occidentalis*, L. Filling most of the pond holes.
99. *Galium trifidum*, L. Common.

COMPOSITÆ.

100. *Eupatorium teucriifolium*, Willd.
101. *Eupatorium perfoliatum*, L.
102. *Solidago sempervirens*, L.
103. *Solidago rugosa*, Mill.
104. *Solidago juncea*, Ait.
105. *Solidago Canadensis*, L.
106. *Solidago nemoralis*, Ait.
107. *Solidago lanceolata*, L. Excessively common.

108. *Solidago Caroliniana* (L.) B. S. P. Nearly as much so.
109. *Aster lævis*, L.
110. *Aster vimineus*, Lam.
111. *Erigeron Canadensis*, L.
112. *Erigeron ramosus* (Walt.) B. S. P.
113. *Pluchea camphorata* (L.) D. C. Abundant and thrifty about Great Salt Pond. August.
114. *Antennaria plantaginifolia* (L.) Hook.
115. *Anaphalis margaritacea* (L.) Benth. and Hook.
116. *Gnaphalium obtusifolium*, L.
117. *Gnaphalium uliginosum*, L.
118. *Ambrosia artemisiæfolia*, L.
119. *Xanthium Canadense*, Mill.
120. *Rudbeckia hirta*, L.
121. *Helianthus tuberosus*, L. Sparingly escaped.
122. *Bidens frondosa*, L.
123. *Bidens cernua*, L.
124. *Bidens lævis* (L.) B. S. P. } probable, but not surely identified.
125. *Anthemis Cotula* (L.) D. C.
126. *Achillea Millefolium*, L. (Pink variety common.)
127. *Chrysanthemum Leucanthemum*, L. Abundant.
128. *Tanacetum vulgare*, L.
129. *Erechthites hieracifolia* (L.) Raf. About Salt Pond.
130. *Arctium Lappa*, L.
131. *Cnicus lanceolatus* (L.) Hoff.
132. *Cnicus horridulus*, Pursh.
133. *Cnicus altissimus* (L.) Willd., var. *discolor* (Spreng.) Gray.
134. *Cnicus arvensis* (L.) Hoff.
135. *Cichorium Intybus*, L. Quite common.
136. *Hieracium Gronovii*, L.
137. *Taraxacum officinale*, Weber.
138. *Lactuca Canadensis*, L.
139. *Lactuca spicata* (Lam.) Hitchc.
140. *Sonchus oleraceus*, L.
141. *Sonchus asper* (L.) Willd. Common on South cliffs.

LOBELIACEÆ.

142. *Lobelia inflata*, L.

ERICACEÆ.

143. *Gaylussacia dumosa* (L.) Torr. & Gray, var. *hirtella* (Ait.) A. Gray.
144. *Vaccinium macrocarpon*, Ait.
145. *Andromeda ligustrina* (L.) Muhl. Occasional.
146. *Kalmia angustifolia*, L. Occasional.
147. *Rhododendron viscosum* (L.) Torr. Occasional.
148. *Clethra alnifolia*, L. Rather common.

PRIMULACEÆ.

149. *Lysimachia terrestris* (L.) B. S. P. Common.
150. *Anagallis arvensis*, L. Common.
151. *Samolus floribundus*, H. B. K. Near the Salt Pond.

ASCLEPIADACEÆ.

152. *Asclepias Syriaca*, L. Common.

GENTIANACEÆ.

153. *Bartonia Virginica* (L.) B. S. P.
154. *Menyanthes trifoliata*, L.
155. *Limnanthemum lacunosum* (Vent.) Gris.

CONVOLVULACEÆ.

156. *Convolvulus sepium*, L.

SOLANACEÆ.

157. *Solanum nigrum*, L. Common and thrifty.
158. *Nicandra physaloides*, Gaertn. Found in one place only.
159. *Datura Tatula*, L.

SCROPHULARIACEÆ.

160. *Verbascum Thapsus*, L.
161. *Linaria Canadensis* (L.) Dumont.
162. *Linaria vulgaris*, Mill.
163. *Ilysanthes gratioloides* (L.) Benth.
164. *Gerardia purpurea*, L.
165. *Utricularia vulgaris*, L.

VERBENACEÆ.

166. *Verbena urticæfolia*, L. Occasional.
167. *Verbena hastata*, L. Very common.

LABIATÆ.

168. *Trichostema dichotomum*, L.
169. *Teucrium Canadense*, L.
170. *Mentha piperita*, L.
171. *Mentha arvensis*, L.
172. *Lycopus Virginicus*, L.
173. *Lycopus sinuatus*, Ell.
174. *Pycnanthemum linifolium*, Pursh. Scarce.
175. *Melissa officinalis*, L. Escaped.
176. *Hedeoma pulegioides* (L.) Pers.
177. *Nepeta Cataria*, L.
178. *Scutellaria lateriflora*, L.
179. *Scutellaria galericulata*, L.
180. *Brunella vulgaris*, L.
181. *Leonurus Cardiaca*, L.

PLANTAGINACEÆ.

182. *Plantago major*, L.
183. *Plantago Rugelii*, Decaisne.
184. *Plantago lanceolata*, L.
185. *Plantago Patagonica*, Juss., var. *aristata* (Nutt.) Grey.

AMARANTACEÆ

186. *Amarantus retroflexus*, L.
187. *Amarantus albus*, L.

CHENOPODIACEÆ.

189. *Chenopodium album*, L.
190. *Atriplex patula*, L.
191. *Salicornia herbacea*, L.
192. *Suæda linearis* (Ell.) Moq.
193. *Salsola Kali*, L.

PHYTOLACCACEÆ.

194. *Phytolacca decandra*, L.

POLYGONACEÆ.

195. *Rumex crispus*, L.
196. *Rumex Actosella*, L.
197. *Polygonum aviculare*, L.
198. *Polygonum erectum*, L.
199. *Polygonum Pennsylvanicum*, L.
200. *Polygonum Persicaria*, L.
201. *Polygonum hydropiperoides*, Michx.
202. *Polygonum Hydropiper*, L.
203. *Polygonum sagittatum*, L.
204. *Polygonum dumetorum*, L., var. *scandens* (L.) Gray.

EUPHORBIACEÆ.

205. *Euphorbia polygonifolia*, L.
206. *Euphorbia maculata*, L.
207. *Acalypha Virginica*, L.

URTICACEÆ.

208. *Humulus Lupulus*, L.
209. *Urtica dioica*, L.

MYRICACEÆ.

210. *Myrica cerifera*, L. Hardly common.

SALICACEÆ.

211. *Salix*. Several species apparently introduced.
212. *Populus alba*, L. About most houses.

ORCHIDACEÆ.

213. *Gyrostachys præcox* (Walt.) Kuntze. August.
214. *Gyrostachys gracilis* (Bigel.) Kuntze. August.
215. *Gyrostachys simplex* (Gray) Kuntze. August.
216. *Pogonia ophioglossoides* (L.) Ker. July—August.
217. *Habenaria tridentata* (Willd.) Hook. Very common. July.
218. *Habenaria lacera* (Michx.) R. Br. Very common. July.

IRIDACEÆ.

219. *Iris versicolor*, L. Common.
220. *Sisyrhynchium anceps*, Cav.

LILIACEÆ.

221. *Smilax glauca*, Walt.

PONTEDERIACEÆ.

222. *Pontederia cordata*, L. July, August. Very common.

XYRIDACEÆ.

223. *Xyris Caroliniana*, Walt. August. Very Common.

JUNCACEÆ.

224. *Juncus effusus*, L.
225. *Juncus marginatus*, Rostk.
226. *Juncus tenuis*, Willd.
227. *Juncus bufonius*, L.
228. *Juncus pelocarpus*, E. Meyer.
229. *Juncus Canadensis*, J. Gay., var. *longicaudatus*. Engelm.

TYPHACEÆ.

230. *Typha latifolia*, L.
231. *Typha angustifolia*, L.
232. *Sparganium eurycarpum*, Engelm.
233. *Sparganium simplex*, Hudson.

ARACEÆ.

234. *Acorus Calamus*, L.

LEMNACEÆ.

235. *Lemna minor*, L.

ALISMACEÆ.

236. *Sagittaria variabilis*, Engelm. Common and thrifty.

NAIADACEÆ.

237. *Potamogeton hybridus*, Michx.
238. *Potamogeton pulcher*, Tuckerm.

CYPERACEÆ.

239. *Cyperus Nuttallii*, Torr.
240. *Cyperus filiculmis*, Vahl.
241. *Cyperus dentatus*, Torr.
242. *Cyperus strigosus*, L.
243. *Dulichium spathaceum* (L.) Pers.
244. *Eleocharis ovata* (Willd.) R. Br.
245. *Scirpus Americanus*, Pers.
246. *Scirpus robustus*, Pursh.
247. *Eriophorum cyperinum*, L.
248. *Eriophorum Virginicum*, L.
249. *Eriophorum gracile*, Koch.
250. *Rynchospora alba* (L.) Vahl.
251. *Rynchospora glomerata* (L.) Vahl.
252. *Carex bullata*, Schk.
253. *Carex lurida*, Wahl.
254. *Carex Pseudo-cyperus*, L. var. *comosa* (Boott.) W. Boott.
255. *Carex straminea*, Willd.

GRAMINEÆ.

256. *Spartina cynosuroides* (L.) Willd.
257. *Spartina juncea* (Michx.) Willd.
258. *Spartina stricta*, Roth, var. *glabra* (Muhl.) Gray.
259. *Paspalum setaceum*, Michx.
260. *Panicum sanguinale*, L.
261. *Panicum proliferum*, Lam.
262. *Panicum capillare*, L.
263. *Panicum vigatum*, L.
264. *Panicum clandestinum*, L.
265. *Panicum dichotomum*, L.
267. *Panicum Crus-Galli*, L.
268. *Chamæraphis glauca* (L.) Kuretze.
269. *Cenchrus tribuloides*, L.
270. *Homalocenchrus oryzoides* (L.) Poll.
271. *Andropogon scoparius*, Michx.
272. *Aristida dichotoma*, L.
273. *Phleum pratense*, L.
274. *Agrostis alba*, L.
275. *Agrostis canina*, L.
276. *Ammophila arundinacea* (L.) Host.
577. *Holcus lanatus*, L.
278. *Danthonia spicata* (L.) Beauv.
279. *Phragmites vulgaris* (Lam.) B. S. P.
280. *Eragrostis pectinacea* (Michx.) Gray.
282. *Poa annua*, L.
283. *Panicularia Canadensis* (Michx.) Kuntze.
284. *Panicularia obtusa* (Nutt.) Kuntze.
285. *Agropyrum repens* (L.) Beauv.

EQUISETACEÆ.

286. *Equisetum arvense*, L.

FILICES.

287. *Woodwardia areolata* (L.) Moore.
288. *Asplenium Filix-fœmina* (L.) Bernh.
289. *Dryopteris Thelypteris* (L.) A. Gray.
290. *Dryoperis Noveboracense* (L.) A. Gray.
291. *Onoclea sensibilis*, L.
292. *Dicksonia punctilobula* (Michx.) A. Gray.
293. *Osmunda cinnamomea*, L.

LYCOPODIACEÆ.

294. *Lycopodium inundatum*, L.

Notes on the Rhode Island Flora.

By J. F. Collins.

Since the publication of the "Plants of R. I." in 1888, many additions have been reported to the author, Mr. Bennett, although it is safe to say there has been very little active work on our State flora since that date. Upon determining the specimens collected by me the past season I find more than 35 species among them not previously recorded as occurring in Rhode Island. Added to these an equal number detected in the two preceding years, and we have a list of 70 species (and varieties) collected by a person who has but a few hours each week to devote to botanical work. Does this not point to "Little Rhody" as still being an interesting field for the local collector?

The greater part of the specimens were collected within the city limits, but little time being found in which to take trips of any length outside. Consequently, as might be expected, the wastes have yielded a large portion, many of which have not fully demonstrated their ability to persist, while of others only single plants have been found. It is my object in these brief notes to mention only some of the more interesting additions and only those collected by me either alone or in company with others. All are represented by specimens in my herbarium, and where duplicates were obtained they have usually been placed in Brown University Herbarium also. Unless otherwise noted all species were collected in this city in 1892.

Nasturtium lacustre, A. Gray, 1890.

Lepidium intermedium, A. Gray, with *L. Virginicum* and *L. ruderale*.

Gypsophila muralis, L., at one station in the southwestern portion of the city, where it has been slowly spreading for the past three seasons, but is still confined to a very limited area in a sandy field.

Lychnis diurna, Sibth., a peculiar form which Dr. Robinson informs me is known to European seedmen as *Melandrium diurnum*, var. *crassifolium*. Wastes only.

Stellaria graminea, L., quite common in grassy places along roadsides, and similar situations. 1884, 1891, etc.

The station for *Lotus corniculatus* (Bot. Gaz. xvii., 229) from which only three specimens were obtained in June was obliterated soon afterwards.

Glycyrrhiza lepidota, Nutt., Cove Lands, J. L. Bennett, 1891; G. H. Leland and J. F. Collins, 1892.

Vicia hirsuta (L.) Koch., a dozen or more specimens obtained. Leland and Collins.

Astilbe Japonica, Miq., seemingly well established and spreading at one station, 1890,–'91,–'92.

Epilobium adenocaulon, Haussk., appears to have escaped detection until July 9th. Since that date I have found it at several stations about the city. At suburban Elmwood it seems to be a common species, particularly on the east shore of Mashapaug pond, where no other *Epilobium* was noticed. In some woods near the pond it grows with *E. coloratum*, Muhl. It has undoubtedly been heretofore confounded with the latter species.

Scandix Pecten-veneris, L., 1890, J. F. C.; 1892, Leland and Collins.

Symphoricarpos racemosus, Michx.; at one station for several years. Possibly an escape.

Galium tricorne, With., several specimens; W. W. Bailey, Leland, Collins.

Grindelia squarrosa, Dunal, and *Artemisia Ludoviciana*, Nutt. Growing together, abundant and apparently well established on wastes.

The latter first noticed at another station while collecting with Prof. Bailey.

Carduus nutans, L. Since 1890, G. Bailey, Bennett, Leland, Collins.

Mentha Canadensis, L., var. *glabrata*, Benth. Shore of Mashapaug Pond.

Dracocephalum parviflorum, Nutt. A single thrifty plant which has fruited abundantly in a place where it is not likely to be destroyed. W. W. Bailey, Collins.

Stachys annua, L. Wastes at one station.

Stachys Germanica, L. Wastes, 1890, G. Bailey, Collins.

This has not to my knowledge been detected since.

Amarantus blitoides, Wats., several times on wastes.

Juncus Canadensis, J. Gay, var. *coarctatus*, Engelm. Wet shores, etc. Elmwood, 1890–91–92; Benedict pond, 1892. Quite abundant at both these stations.

Sagittaria natans, Mx. var. (?) *gracillima*, Wats. In the summer of 1889, while canoeing and collecting on the Ten Mile river above the old Hunt's Grain Mills, in E. Providence, R. I., I noticed large patches of a plant whose long, narrow, delicate leaves floated from 1–3 feet of their length on the surface of the water. Paddling a little farther I soon detected the flowers and obtained a few good specimens. In examining the plants later in the day I was unable to determine the species from any book at hand, and they were temporarily pigeon-holed. Before an opportunity occurred to again look them over, the 6th edition of Gray's Manual appeared, in which the above-named variety was described. This proved to fit my specimens, and the following season I obtained more and better ones, but without fruit, although the plants were abundant.

The river at the place mentioned has been generally considered as the boundary between Massachusetts and Rhode Island, but according to the latest topographical map (surveyed in 1888) the river flows wholly within the borders of the latter State after once entering at Lebanon, yet nowhere north of Hunt's Mills is it more than a quarter of a mile from Massachusetts. Specimens are in the Brown University and Gray Herbaria.

Potamogeton pulcher, Tuck. Found to be one of the commonest pond weeds in many of the pond holes on Block Island. W. W. Bailey and Collins. When collected it was supposed to be the first record for Rhode Island. It was, however, reported from Wakefield in 1890 (to Mr. Bennett).

Naias gracillima (A. Br.) Morong. Benedict pond, also elsewhere by other collectors.

Carex virescens, Muhl. var. *costata*, Dewey, 1890.

C. laxiflora, Lam., var. *varians*, Bailey. Cumberland, 1886; Providence, 1892.

C. laxiflora, Lam., var. *latifolia*, Boott., 1891.

C. echinata, Murray, var. *angustata*, Bailey.

Eragrostis Purshii, Schrader. Abundant along the railway and in woods at Elmwood, R. I., 1884–90–92.

Festuca elatior, L., and also the variety *pratensis*, Gray. Grassy places, 1889–91–92.

PROVIDENCE, R. I.

A Preliminary List of the Plants found in the Ridgewood Water Supply of the City of Brooklyn, King's County, N. Y.

BY SMITH ELY JELLIFFE.

Since the 1st of November, 1892, weekly examinations have been made of the plant life in the drinking water of Brooklyn. The water was taken from the tap of the third-story of a house near Prospect Park. One day in each week it was allowed to run for 24 hours through a filter. The residue was then collected and examined during the week and then kept in glass vials for future comparative study. The following list is a preliminary one, the research being intended to cover the space of one year.

SCHIZOMYCETES.

The examination for bacteria was only partial and purely experimental, Esmarchsproll's were made once each month, but the isolation of the various colonies was not completely carried out.

Bacillus fluorescens, liquefaciens. This bacterium has been prevalent in every month's supply thus far examined.

Bacillus fluorescens, non liquefaciens. Less frequent than the first, still constant.

Bacillus violaceus. Once only observed.

Bacillus subtilis, Cohn. Present throughout the time of the examinations.

CYANOPHYCEÆ.

Oscillaria limosa, Ag. Found throughout February.

Oscillaria Frœlichii, Kütz. Infrequent.

O. aeruigeneo-cærulea, Kütz. December 17, 1892.

CHLOROPHYCEÆ.

Scenedesmus caudatus, Corda. Frequent throughout the six months.

S. dimorphus, Kütz. January 18th.

Pediastrum Boryanum (Turp.) Mengh. November, March.

P. Ehrenberghii (Corda) A. Br. November, March.

P. pertusum, Kütz. December.

Raphidium polymorphum, Fres. Frequent throughout the six months.

var. *sigmoidea*, Rab. January 1st and 18, 1893.

var. *aciculare*, A. Br. January 1, 1893.

Polyedrium longispinum (Pertz.) Rab. Occasional.

Characium Nægelii, A. Br. Observed once only, diagnosis uncertain.

Pleurococcus vulgaris, Menegh. Infrequent.

Dictyosphærium Ehrenberghii, Näg. Occasional.

Spirogyra tenuissima (Hass.) Kütz. During the latter part of January and during February the water was very low in the reservoirs and this species appeared in great quantities.

S. varians (Hass.) Kütz. With the former but in much smaller quantities.

Coleochæte soluta, Prings. December 17th–24th. What seemed to be a broken fragment of this plant.

DESMIDEÆ.

Hyalotheca dissiliens (Smith) Breb. Common from January 29, on.

Desmidium aptogonium, Breb. With *Hyalotheca dissiliens*.

D. Baileyi (Ralfs) Wolle. Only once observed. April 15.

Sphærozosma filiforme, Rab. Occasional.

S. excavatum, Ralfs. Occasional.

S. spinulosum, Deep. ? A plant that resembled this was observed Dec. 2.

Closterium gracile, Breb. Infrequent.

C. striolatum, Ehrb. Occasional.

C. Dianæ, Ehrb. Frequent.

C. rostratum, Ehrb. Common.

Docidium Trabecula (Ehrb.) Näg. Common lately.

Cosmarium moniliforme, Ralfs. Infrequent.

C. Beckii, Wille. Scarce.

Xanthidium cristatum (Breb.) Ralfs. November 27, 1892.

X. antelopæum (Breb.) Kütz. Occasional.

Arthrodesmus Incus (Ehrb.) Hass. Occasional.

A. octocornis, Ehrb. Infrequent.

Micrasterias Torreyi (Bailey) Ralfs. November 23, 1892.
M. radiosa (Ag.) Ralfs. Occasional.
M. denticulata (Breb.) Ralfs. April, 1893.
M. fimbriata, Ralfs. Occasional.
M. Americana (Ehrb.) Kütz. Occasional.
Staurastrum dejectum, Breb. November and April.
S. brevispinum, Breb. Frequent.
S. aristiferum, Ralfs. Infrequent.
S. brachiatum, Ralfs. Infrequent.
S. cuspidatum, Breb. December, 2–24.
S. polymorphum, Breb. Infrequent.
S. crenulatum, Naeg. Common.
S. punctulatum, Breb. December 2.
S. hirsutum (Ehrb.) Breb. April.
S. Arctiscon, Ehrb. Frequent.

DIATOMACEÆ.

Amphora ovalis, Kütz. December 17.
Encyonema ventricosa, Kütz. Not rare.
Stauroneis anceps, Ehrb. Infrequent.
Navicula cuspidata, Kütz. Not common.
N. dilatata, Ehrb. December 17.
N. gibba (Kütz.) Ehrb. Frequent.
N. radiosa, Kütz. Frequent.
N. rhyncocephala, Kg. ?
N. viridis, Kütz. Small forms, infrequent.
Pleurosigma Spenceri, W. Sm. Occasional.
Pleurosigma, sp. indet.
Amphiprora ornata, Bailey. Frequent.
Gomphonema acuminatum, Ehrb. Frequent, var. *coronata*, Ehrb. December 17.
G. capitatum, Ehrb. February 11.
Cocconeis Pediculus, Ehrb. April.
Epithemia gibba (Ehrb.) Kütz. December 2.
Eunotia tridentula, Ehrb. ?
Synedra pulchella, Kütz. Frequent.
S. Ulna (Nitzsch.) Ehrb. Common.
Synedra, sp. indet. Common.

Fragilaria capucina, Desmaz. Common.
Asterionella formosa, Hass. Very common.
Meridion circulare, Ag. Infrequent.
Tabellaria fenestrata, Kütz. Very common.
T. floculosa (Roth.) Kütz. Very common.
Surirella elegans, Ehrb. This large species appeared when the water was very low with *Spirogyra tenuissima*.
Nitzschia, sp. indet.
Melosira granulata (Ehrb.) Ralfs. Very common.
M. varians, Ag. Infrequent.
Rhizosolenia gracilis, H. L. S. Not infrequent.
Tessela interrupta, Ehrb. Placed here provisionally.
Stephanodiscus minutus, Grun. Frequent.
Volvox globator, L. One specimen noted in November.
Gonium pectorale, L. Infrequent.

196 6TH AVE. BROOKLYN, N. Y.

Identity of Anthracnose of the Bean and Watermelon.

BY BYRON D. HALSTED.

The Fungus causing the spotting of bean pods shown in figure 1, was first observed by Lindemuth at Popplesdorf in 1875. It was

FIG. 1.—BEANS WITH POD-SPOT.

named *Glœosporium Lindemuthianum* in his honor by Saccardo and Magnus and described in Michelia, i. 129. In 1878 in his

Report of the Section of Vegatable Pathology for 1887 Professor Scribner records the presence of setæ in the acervuli and suggests that the species might be placed in the genus Colletotrichum. Briosi and Cavara in 1889 made the transfer of the species to that genus and the name became *Colletotrichum Lindemuthianum* (S. & M.), Brio. & Cav., and as such is published as No. 50 in "Briosi and Cavara Funghi Parassiti Della Piante Cultivati." Of special interest in this connection is the statement made by Professor

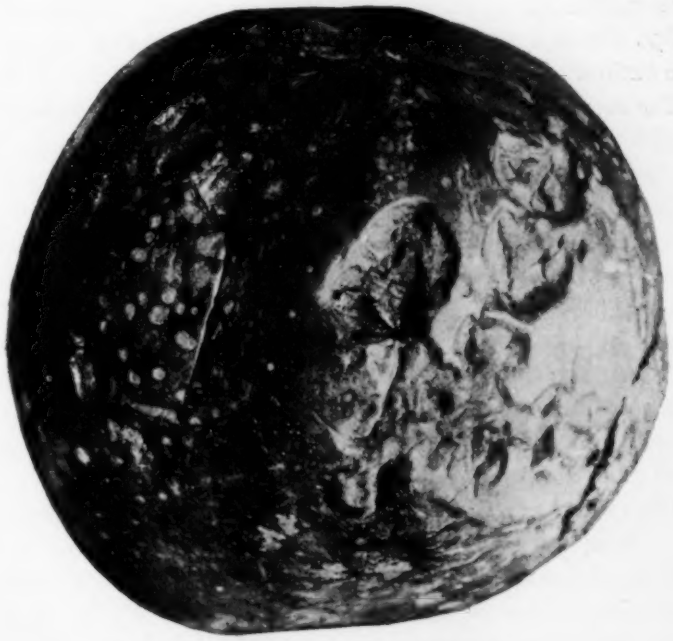

FIG. 2.—RIND ROT OF WATERMELON.

Scribner in the Report previously cited that, "In this country the disease attacks watermelon rinds as well as beans." Farlow records it as upon the watermelon.*

Turning now to the Anthracnose of the watermelon shown in figure 2, it is found that three species of Glœosporium are recorded for Cucurbitaceous fruits, the *G. Lagenarium* (Pass.), Sacc. & Roum. only requiring attention.

*Host. Ind. part 1, p. 47.

In Farlow's Host Index this species is recorded for the following Cucurbits: *Citrellus vulgaris* (Watermelon), *Cucumis Melo* (Muskmelon), *Cucumis sativus* (Cucumber), *Cucurbita Pepo* (Pumpkin), and *Cucurbita* sp. (Squashes).

Early last summer a serious blight of the muskmelon found at Port Monmouth, N. J., by the writer was traced to a *Colletotrichum* which agreed in all particulars with the one upon the bean. Blighted foliage of the watermelon gathered the season before upon examination showed the same characteristics of acervuli, spores and setæ. A blight of cucumbers bitterly complained of in 1890 through the central portion of the State was due to the same anthracnose.

The seemingly perfect agreement of the fungus of these three cucurbit hosts with the Colletotrichum of the bean suggested that the setæ of the so-called *Glœosporium Lagenarium* had been overlooked and inoculations were made for further evidence in the matter. It was not difficult to transfer the watermelon anthracnose to the bean. But the points that may be of interest were the results with a third fruit because admitting of parallel inoculations for both the bean and the watermelon.

Citrons small enough to go under a medium sized tall bell-jar were selected and at first inoculations were made from the watermelon here and there under the skin of the citron, the virus taking quite uniformly and growing luxuriantly.

The *Colletotrichum* virus was taken from the bean and applied to the citron at a few points upon the side of an ink line drawn lengthwise of the fruit, while similar inoculations were made from the watermelon on the other side. Both grew with about equal rapidity and when prolonged the results blended showing identical results as shown in figure 3. In short the appearance to the naked eye was the same and the microscope showed no differences. The work was repeated with uniform results.

Specimen No. 1173, *b*. Ellis, N. A. F., were destributed as "*Glœosporium Lindemuthianum*, S. & M., on watermelon rinds, Wisconsin, Sept., 1885, Prof. A. B. Seymour," At a later date a new label was issued changing the species to *Glœosporium Lagenarium* (Pass.). These specimens show an abundance of setæ in the acervuli and in all points agree with the virus as above used for inoculation.

Years later specimens No. 2448, Ellis N. A. F., were destributed as *Glœosporium Lagenarium* (Pass.), var. *foliicolum*, E. & E., *a* being upon *Cucumis sativus* leaves, and *b*, upon *Citrellus vulgaris* foliage. There is also added leaves of muskmelon with the same fungus.

These all are first-class samples of apparently one and the same *Colletotrichum*, with a *Phyllosticta* associated with it upon the muskmelon. A note accompanies the specimens as follows: "Briosi and Cavara in their Funghi Parassiti No. 100; place this

FIG. 3.—CITRON INOCULATED FROM BOTH BEAN AND WATERMELON.

in Colletotrichum (C. *oligochætum*, Cav.), but if, as we think, this is only a foliicolous form of G. *Lagenarium* it should be C. *Lagenarium* (Pass.)."

An examination of Cavara's species does not show marked points of difference from the Colletotrichum treated above under *Glœosporium Lagenarium*. According to the author the smaller spores and basidia, but chiefly the presence of setæ, serve to separate this from *Glœosporium Lagenarium*. In other words, he fails to realize that under further study the setæ have been found in the

so-called *Glœosporium Lagenarium* as they were in *Glœosporium Lindemuthianum*, and both become *Colletotrichums* and what is more they are probably the same species.

It then remains to see what the name of the combined species shall be. The species under consideration was first published in 1868 by G. Passerini in Erbario Crittigamico Italiano as follows: "*Fusarium Lagenarium*, Pass. Minutum plerumque orbiculare sub epidermis nascens; sporae tereti-oblongatæ, rectæ vel curvulæ interdum oblongo-subclavatæ, nucleo grumoso foetæ pallescentes e basidiis brevissimis densissimeque nascentes epiderme rupta cirrhose diffluentes, demum in acervos irregulares aurantiacos effusæ. Auf Fruchten einer Lagenaria."

This is prior to the *Glœosporium Lindemuthianum*, of Saccardo and Magnus, and therefore the species for the anthracnose of the melon and the bean becomes *Colletotrichum Lagenarium* (Pass.), as suggested by Ellis in 1890 in his xxv. century of N. A. F. No. 2448.

The following is the synonomy:

Fusarium Lagenarium, Passerini (1868).
Glœosporium Lagenarium (Pass.) Sacc. & Roum. (1880).
Colletotrichum Lindemuthianum (S. & M.) Briosi & Cavara (1889).
Colletotrichum Lagenarium (Pass.) E. & Hals., 1893.

Some New Weed Fungi.

By Byron D. Halsted.

The fungi below described are being distributed in Seymour and Earle's "Economic Fungi" Fascicles VI.–VIII.

Phyllostica pallida. Spots large, pale, indefinite; pycnidia usually epiphyllous, dark brown, punctiform, abundant, 45–170 μ in diameter; ostiolum distinct, dark-bordered; spores oblong, mostly straight 4–7 by 1.5–2 μ On leaves of *Silene noctiflora*. Syracuse, N. Y., August, 1892. F. L. Stevens.

Phyllosticta guttulatæ. Spots ash-colored, usually covering whole leaflet; pycnidia large, numerous, black; ostiolum prominent; spores oval, pointed, 9–10 by 3–4 μ., 2–guttulate. On stems and leaves of *Oxalis corniculata*, L., var. *stricta* (L.), Sav. New Brunswick, N. J., July, 1892. A. D. Selby.

PHOMA AMARANTHI. Spots large, indefinite; pycnidia dark brown, irregular, often confluent, prominent, much scattered; spores oval, hyaline, 13–16 μ by 10–12 On stems of *Amarantus chlorostachys*. New Brunswick, N. J., October, 1892. J. A. Kelsey.

SEPTORIA CHRYSANTHEMI. Spots well-defined, dark, equally conspicuous upon both sides of the leaf; pycnidia scattered, ellipsoid (70–160 μ.), pale brown; spores often bent with one end blunt, 14–30 by 1.5–2 μ, hyaline, 3–5-septate. On leaves of *Chrysanthemum Leucanthemum*. Milltown, N. J., June, 1892. F. L. Stevens.

TUBERCULARIA RHOIS. Spots large, brown, concentric, often confluent, becoming apparently worm-eaten; sporodochia disc-shaped, pinkish, scattered; spores hyaline, slightly curved, 6–8 by 2–3 μ. On leaves of *Rhus radicans*, L. New Brunswick, N. J., September, 1882. F. L. Stevens.

CORYNEUM RHOIS. Spots ill-defined, brownish-yellow; acervuli large, scattered; spores fusoid, triseptate, slightly bent, subhyaline, 20–30 by 2.5–5 μ. On leaves of *Rhus radicans*, L. New Brunswick, N. J., September, 1892. F. L. Stevens.

CERCOSPORA MOLLUGINIS. Spots indefinite, yellowish, turning to brown; hyphæ amphigenous, fasciculate from a brownish base, sub-flexuous, 50–60 by 4–5 μ. Conidia very long and slender, tapering, hyaline, slightly curved, multiseptate, 150–450 by 3–4 μ On leaves of *Mollugo verticillata*, L. Short Hills, N. J., September, 1892.

CERCOSPORA ARCTI-AMBROSIÆ. Spots minute, brown, angular, usually with a white center; hyphæ amphigenous, fasciculate from a dark base, geniculate, cylindrical, 80–100 by 3–5 μ; conidia hyaline, curved, tapering, multiseptate, 50–125 by 2.5–3.5 μ On leaves of *Arctium Lappa* and *Ambrosia trifida*. New Brunswick, N. J., September, 1892. F. L. Stevens.

COLLETOTRICHUM XANTHI. Acervuli very large, the affected portion of the stem swollen, often bent, and the surface having a pink color. Setæ stout, bent, septate, not numerous; spores oblong, straight, 12–15 by 4–5 μ. On stems of *Xanthium Canadense*. Near Cape May, N. J., September, 1892.

COLLETOTRICHUM VERMICULARIOIDES. Spots variable, often confluent, border ash-colored with a dark center. Acervuli abundant with numerous black, rigid setæ. Spores oval, hyaline, 12–15 by 4–5 μ. The dark hyphæ at the base of the acervuli give the outward appearance of a *Vermicularia*, hence its name. On leaves and stems of *Linaria vulgaris*, Mill. New Brunswick, N. J., September, 1892.

ENTYLOMA ALSINES. Spots indefinite, pale; conidia fasciculate, filiform, 50–90 by 2 μ; spores globose, thin-walled, hyaline, smooth, 12–18 μ. On *Alsine media*. New Brunswick, N. J., July, 1892.

Additions to the New Jersey Flora.

Three species of plants, not heretofore recorded for the State of New Jersey, have been found in the vicinity of New Brunswick in considerable numbers during the two past years.

The first of these was seen by Mr. J. A. Kelsey in 1891, but no attempt at classification was made till the following year, when it was determined as *Sisymbrium Alliaria* (L.) Scop. Only two small bunches of it were seen, one under a cliff close to the bank of the Raritan River, and the other near by on top of the cliff. Later in the season it was discovered that the plant was liberally distributed over an area of several square miles of the adjoining country, and in some places was so abundant as to be considered a weed by the farmers, who, recognizing its affinity to the Cruciferæ, had already christened it White Mustard. The Manual gives the locality of this plant as "near Georgetown, D. C."

Triosteum angustifolium, L., credited by the Manual with growing anywhere from Virginia to Illinois and from Missouri to Alabama, was found by the writer in abundance in moist woods near Milltown, N. J., in June 1892, and in August the fruiting plants were collected at Rocky Hill, N. J., where they were abundant and very conspicuous on account of the bright color of the drupes.

Scutellaria parvula, Michx., was found in 1892 at Piscataway, N. J., in small quantity, and was very abundant on the cliffs on

the banks of the Raritan just north of New Brunswick, where it has been noticed for several years.

F. L. STEVENS.

NEW BRUNSWICK, N. J., April 17, 1893.

[The discovery of *Triosteum angustifolium* in Central New Jersey is of much interest because it connects the outlying station long known at Glen Cove, Long Island (BULLETIN, i. 41, ii. 2), with those in Pennsylvania and Virginia; *Scutellaria parvula* and *Sisymbrium Alliaria* were both collected at New Brunswick by Miss Anna M. Vail in 1890, but the station does not seem to have been recorded; the latter has long been known from Long Island (BULLETIN, i. 22, xi. 83) and Westchester county, N. Y. (BULLETIN, vi. 100), N. L. B.]

Additions to the Tennessee Flora.

Cimicifuga racemosa (L.) Nutt. var. *cordifolia* (Pursh.) Gray. This plant grows in rich soil on a wooded bluff of the Tennessee River, about one mile below Knoxville. It was first collected by me in September, 1890; and, again, in the same month of the following year. So far as I know, this *Cimicifuga* has never before been found outside of North Carolina. It differs considerably from *C. racemosa* in its period of flowering, the latter being out of flower here by the first of July, usually earlier. It it entirely odorless, and is readily distinguished from the type by its large, cordate leaflets.

Meibomia ochroleuca (M. A. Curtis) Kuntze. I collected a single specimen of this *Meibomia* in a dry, open wood near Knoxville, August 29, 1890. I have never seen it since. The range of this species is thus extended west of the Alleghanies.

Alchemilla arvensis (L.) Scop., is abundantly naturalized in dry fields about Knoxville, It grows with *Trifolium procumbens*, var. *minus*, *Houstonia minima*, *Plantago heterophylla*, etc., and appears as if indigenous.

Antennaria plantaginifolia (Linn.) Hook, var. *monocephala*, Torr. and Gray.—Early in April, 1891, I came upon a peculiar form of *Antennaria plantaginifolia* growing on a bank in a wooded glen near Knoxville.

There were about thirty plants, all pistillate, growing with the ordinary form. I collected several specimens, but was unable to "place" the plant to my satisfaction, and laid it aside. A short time ago my friend, Prof. A. Ruth, sent a specimen to Dr. N. L. Britton for determination. By him it was referred to *A. plantaginifolia* (Linn.) Hook., var. *monocephala*, Torr. & Gray, heretofore known only from Louisiana. The variety differs from the type in several particulars. The single heads are about twice as great in diameter. The cauline leaves are narrower and more appressed and bract-like. The involucral scales are narrower and taper from near the base to the more or less acute apex. They are quite conspicuously marked with crimson below the scarious tips. In habit of growth and in size and form of the root-leaves, there seems to be no departure from the type. There were no transition forms among the specimens observed. If the characters above stated are constant, this *Antennaria* should be maintained as a good variety.

Lithospermum tuberosum, Rugel. Collected near Knoxville by Prof. F. Lamson-Scribner in April, 1890. In the same month of the following year, collected by myself on the summit of a wooded bluff, a short distance above Knoxville. Corresponds, in every particular, to Florida specimens of A. H. Curtiss' collection. Distribution, according to the Synoptical Flora, Fla. and Tex.

T. H. KEARNEY, JR.

UNIVERSITY OF TENNESSEE, Knoxville.

Aster leiophyllus, n. sp.

(PLATE CLVII.)

By the further study of living plants in the field and of dried specimens from new and distant localities, I am now convinced that the *Aster* published by me in the BULLETIN, xvi. 67, as *A. cordifolius*, L., var. *lævigatus*, is a distinct species, and, since *lævigatus* cannot be retained because of former use, I have chosen another name of similar meaning. Although the new species bears a general resemblance to *A. cordifolius* and sometimes grows with it, no forms intermediate have been discovered. The leaves, in the fresh state, are usually thickish and leathery, and perfectly smooth, with a greasy feel, but in the dried state are much thinner,

when the raised veins on the under surface renders it somewhat roughish to the touch. The broadly-margined petioles are also strikingly characteristic, so that Dr. Gray, to whom the plant was sent a short time before his death, wrote me that he had never seen before an *Aster* with just such leaves.

No specimens of it have reached me from New England. As far as known its range extends from Southern New York and Northern New Jersey through Pennsylvania and Western Maryland to Eastern Kentucky and Ohio, but it is likely to be observed west and south of these limits.

Var. LANCEOLATUS (*A. cordifolius*, var. *lanceolatus*, Porter, BULLETIN, xvi. 68.

Var. INCISUS (Britton), *A. cordifolius*, var. *incisus*, Britton, BULLETIN, xix. 224.

To the stations for the latter given by Dr. Britton may be added Moosic Lake, Lackawanna County, Pa., where I collected it in 1884.

It may be of interest also to mention that two northern species of the same genus have been lately found in this neighborhood, *A. patulus*, Lam., at Bethlehem by E. A. Rau, and *A. amethystinus*, Nutt., on the Delaware near Easton, by A. A. Tyler.

THOMAS C. PORTER.

Botanical Notes.

Our Index to Recent literature relating to American Botany. An editorial in the "Botanical Gazette" for May makes flattering reference to this department of the BULLETIN, but expresses the wish that something more extensive and complete might be furnished for recording the writings of American botanists—something on the plan of Just's "Botanical Jahresbericht," which forms two thick octavo volumes each year, and is supposed to record and abstract all botanical writings the world over, but which has always been markedly deficient in its allusions to American publications, and which is always from 18 to 30 months behind the time.

The suggestion appears to us as a very happy one, and the present editors of the BULLETIN would gladly see it carried out.

The pressure on our pages for the publication of original matter is such that it has at times been seriously debated whether we ought not to abandon the "Index," and the labor of keeping it up and attempting to scan all the periodical literature of the day, has made most serious inroads upon our time. We believe that we have recorded the great bulk of botanical papers relating to American plants during the time the "Index" has been carried along (1886–1893), but that there have been noteworthy omissions is certain, and we have been forced to notice hundreds of articles by title only, which would have been abstracted, if there had been more time and space.

One method of carrying out the Gazette's suggestion, and it may be the most practical method, so far as the preparation of the material goes, would be for persons at each of the botanical centres to make themselves responsible for certain of the journals and society publications, abstract the papers therein and send the abstracts to a central point to be collated and arranged: the abstracts to be written on blanks prepared for the purpose. It would be necessary for some one to act as editor-in-chief, and that there should be a large number of abstractors as associates. The first thing to be done would be to ascertain just what periodicals were regularly received at each of the centres participating in the work, and then to assign the periodicals. The books and pamphlets printed as such would naturally be assigned to persons whose work lay along the lines of the subjects treated. As to publication, we conceive that this should be regularly conducted at intervals, say of three months, which would make in effect another botanical journal. The "Gazette" doubts that this would pay for itself from subscriptions. But would not this be an appropriate organ for the "Botanical Society of America," proposed by Professor Bailey at the Rochester meeting of the American Association, and for the organization of which a committee was then appointed? (See BULLETIN xix. 294.) We believe that there are as many as 200 botanists in America who would be willing to form such an organization with dues at five dollars per annum, which would provide an income of $1000 irrespective of sales, and the number of botanists in the country is steadily increasing. Such a sum as this would warrant the printing and distribution of 600 or 700 pages annually.

It is interesting to note that when the "Index" was commenced the "Gazette" expressed the hope that there would be sufficient matter to "keep this department always full, but we doubt it." (Bot. Gaz. xi. 66.)

Sphagna Boreali-Americana Exsiccata. Prospectus.—The undersigned propose to issue, about two years from the present time, sets of specimens of North American Sphagna. The number of species attributed to the United States and British America is now nearly fifty, and many of them have never been distributed.

Many of the species are represented by several varieties; so that for anything like a full series, there should be at least one hundred forms in the collection; perhaps one hundred and thirty would be a better estimate. It is proposed to prepare not less than sixty sets of the specimens, and to offer a set to each person who may supply three or more acceptable forms in quantity sufficient for distribution. The remaining sets will be used for foreign exchanges, and for sale at a price to be named hereafter. Promises of assistance have been received already from Mrs. E. G. Britton of Columbia College, Prof. John Macoun of Canada, Dr. W. A. Setchell and Dr. A. W. Evans of New Haven, Dr. A. W. Chapman of Florida, Mr. J. K. Small of Lancaster, Penn., Mr. Edward L. Rand of Boston, and others, and there is every reason to hope that the collection may be made to include nearly all the known species of temperate North America.

Most of the species the undersigned feel competent to identify; any that are in the least degree doubtful will be submitted to Dr. C. Warnstorf, the most learned living sphagnologist, for final determination.

A few hints as to preserving specimens may be offered. All the plants for one series of sixty specimens should be gathered at one time and place, to avoid the chance of mixing two different forms under one number. The plants of dense habits of growth should be separated into broad, thin specimens while fresh, cleaned of foreign matter, and preserved in botanizing portfolios in the usual manner, taking care not to subject them to any severe compression. Just enough pressure to keep them flat is enough. Floating plants, such as the plumose forms of *S. cuspidatum*, are best prepared by spreading the specimens on letter-paper, as is

usual in preserving the more delicate seaweeds. If the collector has no means of pressing the specimens, they may be gathered in bulk, and, when air-dried, sent in packages to Professor Eaton, who can have them softened and spread out for drying at some convenient time. Care should be taken to note the place and time of each collecting, and the approximate height of the station above sea-level.

The coöperation of American Botanists is respectfully asked for; and letters or collections may be addressed to either of the undersigned.

DANIEL C. EATON.

YALE UNIVERSITY, New Haven, Conn.

EDWIN FAXON.

317 LAMARTINE STREET, JAMAICA PLAIN, MASS., April, 1893.

Note on some Characeæ.—The first fascicules of the second part of the "Characeæ of America" was issued at the close of 1892. I omitted to affix any date, so that this notice seems necessary to secure priority for the new species therein described. *Nitella formosa*, Allen, described as a new species in this volume of the BULLETIN, p. 119, now turns out to be a form of *N. hyalina*, A. Br., related to *N. hyalina*, var. *Engelmanni*, A. Br., first described as *N. Engelmanni*, A. Br. I have recently had the opportunity to examine the Engelmann collection of Characeæ belonging to the Shaw School of Botany, in St. Louis. This collection is rich in types of A. Braun's species; it contains one fine specimen of *N. Engelmanni*, of which I have secured photographs.

T. F. ALLEN.

Ipomœa pandurata. Not long ago my attention was drawn to a huge root, which was unearthed by the workmen in the cemetery of this place (Springfield, Ohio). On examination it proved to belong to the above named species. This particular root is remarkable only for its size. I have never heard of the root of this species reaching the size of the one I am describing, therefore I think it worthy of record. Professor Gray says the root often weighs from ten to twenty pounds. The weight of the specimen here was found to be twenty-five pounds. The length was about two and a half feet, and the diameter over six inches at the thickest part. Flowers of this "Man-of-the-Earth" have been observed annually for twenty-nine years at the place where the root was dug up.

A. F. LINN.

WITTENBERG COLLEGE, May 15, 1893.

Reviews of Foreign Literature.

De la Culture artificielle des Diatomees. Dr. P. Miquel. (Le Diatomiste, 1892–93, pp. 93–99; 121–128; 149–156; 165–172.)

In this series of articles just completed Dr. Miquel records, with great minuteness, the results of his experiments in propagating diatoms in the laboratory. He starts out by stating that in order to cultivate diatoms successfully, it is necessary to provide them with two kinds of food—saline food and organic food. Then follow formulæ for such nutritive fluids, and directions in detail for using them, together with suggestions as to light, temperature and sterilization of the culture fluid so as to prevent the growth of organisms which are inimical to the growth of the diatoms. The experiments include marine as well as fresh water cultures, and in the concluding article directions are given for the construction of culture cells, so that the various stages of growth may be watched under the microscope.

Not the least interesting portion of the paper is that which relates to the production of strange and abnormal varieties by varying the character of the culture fluid. These varieties Dr. Miquel calls "teratological growths." He states that he has followed them to the third generation, and describes some of the remarkable variations in form which resulted.

Within the last few years much attention has been given to the life history of diatoms, but no article bearing upon that subject has lately appeared that is likely to attract more attention than this. Dr. Miquel's experiments have suggested new lines of research, and they will doubtless be reported by other diatomists. The results of these observations will be watched with interest. The experiments in regard to "teratological growths," in particular, may clear up much of the present obscurity in regard to species, and may result in bringing together many now regarded as distinct. C. H. K.

Beitrage zur einer Monographie der Gattung Habenaria, Willd. F. Kranzlin. (Engler's Bot. Jahrb. xvi. 52–223.) This contribution towards a monograph of the genus *Habenaria* enumerates 347 species, mostly South American, African and Asiatic. The only species noted for the United States are two Southern species, *H.*

quinqueseta (Mx.) under the name *H. Michauxii*, Nutt., and *H. repens*, Nutt.

An interesting question in nomenclature is suggested by the author's use of *H. fimbriata*, Wight, for a species of the East Indies. Wight in 1852 adopted this name apparently under the impression that the *Platanthera fimbriata* of Willdenow, applied to a different genus, which would leave him at liberty to use it for *Habenaria*. But the name *fimbriata* must be rejected both in this case as well as in the case of our own *fimbriata*, so-called, as it was employed by Aiton in 1813 as a synonym of *H. psycodes* (L.), Asa Gray. T. M.

Rabenhorst's Kryptogamen Flora, Part 21, pp. 449–512 (1893), Mniaceæ and Meeseaceæ. Several changes in the genus *Mnium* which affect our North American species are of interest: *M. Seligeri*, Milde (1869), and *M. rugicum*, Laurer (1827), are separated from *M. affine*, Bland, the leaves of the former being long-decurrent at base with the marginal teeth one-celled, the second indistinctly toothed with base short-decurrent, and the last also short-decurrent, but the teeth composed of 2–4 cells. None of the older names adopted by Lindberg are accepted. E. G. B.

Proceedings of the Club.

TUESDAY EVENING, MAY 9TH, 1893.

The President in the chair and 32 persons present.

Miss Gertrude Appleby, of New York, was elected an Active Member.

The committee appointed at the meeting of April 11th, 1893, to draw up a suitable minute regarding the death of M. Alphonse De Candolle for publication in the proceedings of the Club, presented the following report, which was accepted:

M. Alphonse De Candolle, an Honorary Member of this Club and one of the most eminent botanists of our time, died at Geneva, Switzerland, April 4th, 1893, in the 87th year of his age.

He was born at Paris, but resided most of his life in and near Geneva. He was a son of the equally famous Augustin Pyramus De Candolle, and was associated with him in much of the botani-

cal work that has made the family name a household word in the science of all countries.

On the death of his father in 1841 he succeeded to the authorship and editorship of the "Prodromus systematis naturalis regni vegetabilis," the great work in which the elder De Candolle hoped to concisely describe all the known plants of the world, his name appearing on the title page of the eighth volume, issued in 1841, and continuing up to the issue of the seventeenth, in 1873, when the work was abandoned, its place being taken by the "Monographiæ Phanerogamorum," a series of seven thick volumes of which has been printed. Among his earliest works is the noteworthy "Monographie des Campanulées," a quarto of 384 pages and 20 plates, issued in 1830, M. De Candolle being then but 24 years old. In later years he devoted himself to the study of geographical distribution, and in 1855 his "Geographie botanique raisonée" appeared in two volumes of 1366 pages. He was the moving spirit in the International Botanical Congress, held at Paris in 1867, when the modern laws of botanical nomenclature were framed; and if these had been carried out in the way they were intended, there would have been no necessity for the recent movements to secure a stable system of plant names. More recently he has critically investigated the origin and history of cultivated plants, and published numerous papers on this subject, bringing together in his "Origin of Cultivated Plants," in 1882, about all the reliable information that was then extant.

In view of the loss which botanical science has experienced by his death, we recommend the adoption of the following resolution:

Resolved, That by the death of Alphonse De Candolle, after a long life rich in contributions to the knowledge of mankind, botanical science has suffered an irreparable loss; and

Resolved, That the sympathy of the TORREY BOTANICAL CLUB is extended to the family of the deceased savant.

N. L. BRITTON,
HENRY H. RUSBY,
Committee.

The Acting Secretary directed attention to the prospectus of the Hodgkins Fund Prizes for investigations and essays on the nature of atmospheric air, issued by the Smithsonian Institution.

Mr. Small exhibited specimens of *Catharinea crispa* from Atlantic Highlands, N. J., adding another to the few localities known for this moss. It occurred in abundance at this station.

Mr. Theodore G. White read a paper entitled "Preliminary Notes on the North American Species of *Lathyrus*," illustrated by specimens. The paper was discussed by Judge Brown and Dr. Morong.

Dr. Britton delivered an illustrated lecture on the "Structure and Classification of Grasses."

WEDNESDAY EVENING, MAY 31ST, 1893.

Vice-President Morong in the chair and 21 persons present.

Dr. Morong exhibited fruits of the Doum palm, *Hyphæne Thibetica*, brought by Miss Vail from Egypt; also a fruit of *Mauritia flexuosa*, the Miniti or Ita palm of Brazil.

Dr. Britton remarked on *Pyrola oxypetala*, Austin, known only from the original station at Deposit, Delaware County, N. Y., and exhibited one of the type specimens. He also stated that in company with Professor Porter he had observed at the Nockamixon Rocks, Bucks county, Penna., on May 30th, *Senecio aureus*, L., and *Senecio Balsamitæ*, Muhl, growing side by side in a marshy meadow; the former was in full bloom, while the latter showed no signs of expanding its involucre. He maintained that it is a distinct species, and not a variety of *S. aureus*.

Dr. Britton also showed a copy of a pamphlet entitled "The Torrey Festival," which contains an account of the proceedings at the dinner given to Dr. Torrey, December 20, 1867, by the Botanical Club of New York, under which name the Torrey Botanical Club first met, in commemoration of the completion, in 1817, of the "Catalogue of Plants Growing within Thirty Miles of New York."

The announced paper of the evening was by Mr. John K. Small and Miss Anna Murray Vail, on "A Report of the Exploration of Southern Virginia during the Summer of 1892." Herbarium specimens of the more interesting species collected were shown, among them some 12 new to the range of Gray's Manual. The paper will be published in the MEMOIRS.

Mr. Lighthipe reported *Lupinus perennis* with white flowers

from near Princeton, N. J., *Helonias bullata* from the same locality, and *Mertensia Virginica* from Rocky Hill, N. J.

Dr. Morong reported *Silene Pennsylvanica* with white flowers from Woodhaven, Long Island.

A general discussion on the occurrence of albinism followed, in which remarks were made by Dr. Morong, Miss Vail, Mrs. Britton and Mr. Lighthipe.

Index to Recent Literature Relating to American Botany.

Adventitious Budding in Æsculus Hippocastanum. Walter C. Kerr (Proc. Nat. Sci. Assoc. Staten Island, April 8, 1893).

Ascyrum Crux-Andreæ (Meehan's Month, iii. 65).

Bacteria in Vegetable Tissue—Non-Parasitic. H. L. Russell (Bot. Gaz. xviii. 93).

Beitrage zur Kenntniss exotischer Sphagna. C. Warnstorf. (Hedwigia, 1893, 1–17, plates i–iv. reprinted).

Several corrections of American specimens and species are made, and all those who have been sending material to Dr. Warnstorf for naming will do well to consult this publication. Several changes are made in Macoun's Canadian mosses, and the range of several species is extended. *S. Labradorense*, Warnst., *S. Lindbergii*, Schpr., *S. Floridanum*, Cardot, *S. Mendocinum*, S. & L., *S. Dusenii*, C. Jensen, *S. Girgensohnii*, Russ., var. and *S. Garberi*, L. & J., are described and figured.

Botanical Laboratory in Pharmaceutical Manufacture—The work of a. John S. Wright (Science xxi. 183).

Botanical Notes from Texas. E. N. Plank. (Gard. and For. vi. 162.) Notes on *Sesbania Cavanillesii, S. vesicaria, Oxalis dichondræfolia, Prunus Caroliniana, Xanthoxylum Fagara, Clematis Drummondii* and others.

Botanical Survey of Nebraska. Report on Collections made in 1892 (pp. 46, Univ. Neb. 1893).

This pamphlet contains (1) Flora of the Sand Hill Region of Sheridan and Cherry Counties, and List of Plants collected on a Journey through the Sand Hills in July and August, 1892, by Jared G. Smith and Roscoe Pound, including sixteen plants new

to the State; (2) Notes on the Canon Flora of Sioux County with List of Plants collected in July and August, 1892, by A. F. Woods, with some twenty additions to the State Flora, *Volvaria viscosa*, Clements and *Mycena acutoconica*, Clements, being two new Fungi; (3) Miscellaneous Additions to the Flora of the State, and new or noteworthy Species from various Localities including *Coprinus granulosus*, *Inocybe tuberosa*, *Pholiota speciosa* and *Lepiota avellanea*, new species described by Mr. Clements.

Bouteloua—Les Fleurs des. H. Baillon (Bull. Mens. Soc. Linn. Paris, i. 1087, 1088).

Brasenia peltata, Pursh—The Glandular Hairs of. Ida A. Keller. (Proc. Acad. Nat. Sci. Phila. 1893, 188).

Calypso borealis (Gard. Chron. xiii. 421).

Carex baccans C. B. Clarke (Bot. Mag. t. 7288).

Carnivorous Plants—Recent Studies of. Jared G. Smith. (Am. Nat. xxvii. 413).

Catabrosa aquatica—Les Fleurs du. H. Baillon (Bull. Mem. Paris, i. 1072).

Cattleya iricolor. (Bot. Mag. t. 7287).

Chara—Description of a new fossil Species of. F. H. Knowlton (Bot. Gaz. xviii. 141–142; illustrated).

Chara Stantoni. From the Upper Cretaceous of Wyoming.

Contribution to the Biology of the Organism causing Leguminous Tubercles. Geo. F. Atkinson (Bot. Gaz. xviii. 157–166; three plates).

Corallorhiza—The Genus. M. B. Thomas (Bot. Gaz. xviii. 166–170 two plates).

Cretaceous Plant Population—The Probable Physiognomy of the. Conway McMillan (Am. Nat. xxvii. 336).

Cypripedium Chamberlaini. W. H. Gower (Garden, xliii. 304 with colored plate).

Cypripedium spectabile.—Is it poisonous to the touch? Henry J. Jesup (Bot. Gaz. xviii. 142–143).

Referring to a note in the BULLETIN, vi. 15, Prof. Jesup adduces facts in support of the theory that this plant may excite symptoms similar to poisoning by *Rhus*.

Datos para el estudio de la produccion del Chicle. Fernando Altamirano (El Estudio, iv. 251).

With illustration of *Asclepias laungnosa*, H. B. K.

Decay in the Apple Barrel. B. D. Halsted (Pop. Sci. Month. xliii. 76, illustrated).

Enumeration of the Plants collected by Dr. Thomas Morong in Paraguay, 1888–90. By Thomas Morong and N. L. Britton with the assistance of Miss Anna Murray Vail. Contributions from the Herbarium of Columbia College, No. 35 (Annals New York Acad. Sci. vii. 45–280).

This handsomely printed volume of 235 pages describes that portion of the Paraguayan flora which was collected by Dr. Morong during a recent visit of two years to that country. In the course of that time the region within a hundred miles of Asuncion, and the uninhabited portions of the Gran Chaco wilderness, for 400 miles up the little known Pilcomayo River, was very thoroughly searched. The collection, including the Mosses, foots up not quite 1000 species, nearly one-tenth of which are new. It represents 106 orders, the most numerous being the Compositæ, Leguminosæ, Gramineæ, Cyperaceæ, Euphorbiaceæ, Solanaceæ, Malvaceæ and Filices, which are the most common orders in South America. Of the five species of Palms enumerated, two are described as new to science; of the thirty-six Euphorbiaceæ, five; of the ten Myrtaceæ, four; and of the ten Asclepiadaceæ, five, the most remarkable, perhaps, being the last. The new species are described by Drs. Britton and Morong, and all the determinations were made after a careful comparison of the plants with the collections at Columbia College and Kew. In this labor the authors were assisted by such eminent European botanists as J. G. Baker, Edmund Baker, A. Cogniaux, N. E. Brown, M. T. Masters, A. Franchet, Casimir De Candolle and R. A. Rolfe, so that there is every reason for regarding the identification of the species as correct. A large part of the value of this enumeration lies in the notes, which are very full. The peculiarities of nearly all the species named in measurement, color, habitat, habit, and other interesting particulars concerning their economical uses and surroundings, are taken from the field notes of Dr. Morong, which were made while the specimens were fresh, and after many inquiries made among the natives of the country as to the local names and uses. There is scarcely a species given which might not at once be identified by any visiting botanist from these notes

here given, so that future explorers of this region will have an easy time of it, so far as this enumeration goes.

It should be placed on record as a happy circumstance that a North American botanist in this distant and not easily accessible South American country should have met with such remarkable success as attended the work of Dr. Morong. After a voyage of seventy days across the Atlantic, in which not a single storm occurred, and after a sojourn of two years, much of it spent in a remote wilderness inhabited only by roving Indians and wild animals, with not a mishap or a single day's illness to detract from his good fortune, the collector circumnavigates the South American continent, and returns to his own land in perfect health. Of the 12,000 or more specimens collected, not one is lost, and within three years from the time of his return the whole collection is collated, enumerated and published—a fact which is thought to be without a parallel. A. H.

Enumeration of the Plants collected in Bolivia by Miguel Bang with descriptions of new Genera and Species. Henry H. Rusby (Mem. Torr. Bot. Club, iii. pp. 67; issued April 27, 1893).

The collections made by Dr. Rusby in Eastern Bolivia during the years 1885 and 1886 proved so rich in novelties, and in species hitherto very little known, that he determined, if it should become possible to supplement his material by additional specimens from the same region, and this was the more especially desirable from the fact that owing to the conditions under which Dr. Rusby made his way through the country, he was able in many instances to bring away but a single specimen of a species. Opportunity for continuing his work was afforded in 1889 by the engagement of Miguel Bang, a Danish gardener of La Paz, to collect material in bulk and ship it to New York. The results have more than justified the arrangement, for in addition to securing some of the best things obtained by Dr. Rusby a very large number of additional new species have been obtained, and most of them in sufficient quantity to make up twenty complete sets, which have been placed in the principal herbaria of America and Europe.

The present paper enumerates the Polypetalæ and Gamopetalæ up to Lobeliaceæ of Mr. Bang's numbers from 1 to 1000, and describes 90 species as new, besides defining a number of

nomina nuda. The remainder of the plants included between these numbers will form a second paper, to be issued in the autumn of the present year on Dr. Rusby's return from Europe, where he is now engaged in making comparisons with named material at Kew and Berlin, and subsequent papers will complete the account of the collections, the accumulation of which, it is hoped, will continue over several years longer. Mr. Bang's numbers have now reached about 2000, and taken together with Dr. Rusby's collection represent over 3500 species. These, with the collections of Mandon and Weddell, the best sets of which are in the Paris Herbarium, and those of Pearce and Pentland at Kew, probably indicate about 5000 species from Bolivia. Dr. Otto Kuntze has recently made some collections in the territory, and we understand is now engaged in their determination. It is a cherished plan of Dr. Rusby and the writer to ultimately bring an account of all this material together in the form of a Flora of Bolivia; but time alone will show whether this enterprise can be brought to a successful termination. N. L. B.

Erythronium—The Range of Variation in Species of. M. E. Meads (Bot. Gaz. xviii. 134–138; one plate).

Flora of Montreal Island—Changes in the. Robert Campbell (Can. Record Sci. v. 294).

Forests of the South—The. Henry L. Tolman (Gard. and For. vi. 158).

Fossil Diatoms in Philadelphia beneath the New Girls' Normal School Building—Marine clays overlying fresh-water clays at some other localities. Lewis Woolman (Microscopical Bulletin, ix. 33–34).

The author calls attention to the fact that in most of the clays that lie immediately beneath the surface of the old city proper, and which have an elevation of less than 40 feet above mean high tide, there is a considerable showing of sponge spicules and diatoms. The diatoms are both fresh-water and marine, the latter predominating. There is given a list of 31 species from the deposit at Thirteenth and Spring Garden streets, found thirteen feet beneath the surface. C. H. K.

Frost Freaks of the Dittany. Lester F. Ward (Bot. Gaz. xviii. 183–186; one plate).

Note on *Cunila Mariana* as a "frost-weed."

Galinsoga parviflora in Italia—Sulla. P. Bargagli (Bull. Soc. Bot. Ital. 1893, 151).

George Vasey: A Biographical Sketch. Wm. N. Canby and J. N. Rose (Bot. Gaz. xviii. 170–183, with portrait).

Habenaria fimbriata. Henry G. Jesup (Bot. Gaz. xviii. 189, 190, illustrated).

Note on flowers of this species with the lip entire

Hardwood Trees of Illinois—Notes on the, VI., VII. J. Schneck (Hardwood, iii. Nos. 4, 5).

Herbarium—The Growth of the General. (Quarterly Bull. Univ. Minn. i. 70.)

How to Know the Wild Flowers. Mrs. William Starr Dana, illustrated by Marion Satterlee (298 pages, 1893, Chas. Scribner's Sons).

This attractive little book merits the success which it has already met with, not only for its numerous and excellent illustrations, but for the clear and simple descriptions of our common flowers, as well as for the interesting information of a scientific or literary nature. The arrangement is by colors, and seasons and the habits, uses and popular names receive due mention. There are 104 full-page illustrations, which alone would make it easy to recognize most of the pretty wild flowers. E. G. B.

Hybrid Oak—Another. A. S. Hitchcock (Bot. Gaz. xviii. 110; with plate). The record of the discovery of an interesting tree near Manhattan, Kansas.

Hymenomyceteæ of Orleans Co., N. Y. Chas. E. Fairman (Proc. Rochester Acad. Sci. ii. 154). 126 species are catalogued.

Lagoa Santa (Brezil) Etude Geographique Botanique. Eug. Warming (Rev. Gen. de Bot. v. 145; with illustrations).

Lepismium Knightii, Pfr. (Monats. Kakteenk. iii. 40; with illustration).

Liliaceens Brasiliens—Die Officinellen. Theodor Peckholt (Pharm. Rundsch. xi. 80).

Marantaceæ nonnullæ Ecuadorienses. H. Eggers (Bot. Centralbl. liii. 305). *Calathea Petersenii, C. Sodiroi* and *Ischnosiphon Morlæ* are described as new, and two of the species illustrated.

Mitchella repens. (Meehan's Month. iii. 49, with colored illustration.)

Mexico—Additions to the Phænogamic Flora of. B. L. Robinson and H. E. Seaton (Proc. Am. Acad. Arts and Sci. xxviii. 103).

New species are described in the genera *Thalictrum*, *Polygala*, *Abutilon*, *Pavonia*, *Astragalus*, *Stylosanthes*, *Cotyledon*, *Sedum*, *Cuphea*, *Fuchsia*, *Cyclanthera*, *Piqueria*, *Stevia*, *Eupatorium*, *Brickellia*, *Sabazia*, *Verbesina*, *Tridax*, *Schkuria*, *Senecio*, *Cacalia*, *Cnicus*, *Perezia*, *Lobelia*, *Arctostaphylos*, *Gentiana*, *Halenia*, *Krynitzkia*, *Russelia*, *Castilleia*, *Pedicularis*, *Dicliptera*, *Salvia*, *Spiranthes*, and *Dioscorea*.

Monilia fructigena—On. James Ellis Humphrey (Bot. Gaz. xviii. 85, with plate).

Myxomycetes—On two new or imperfectly known. W. C. Sturgis (Bot. Gaz. xviii. 186, 187, one plate).

Description and illustration of *Comatricha cæspitosa*, n. sp., and *Physarum sulphureum*, Alb. & Schw.

Naiadaceæ of North America. Thomas Morong (Mem. Torr. Bot. Club, vol. 3, No. 2, pp. 65, 55 plates; issued March 15, 1893).

So little has been done with the order named above, since the work of Chamisso in Linnæa, vol. 2, 1827, and the 3d Mantissa of Roemer and Schultes, which appeared after the Linnæa, though in the same year, that one feels constrained to welcome a publication on it, especially coming from an author who has studied it for many years; and if we cannot agree in all points with him, we at least know it is the outcome of honest work and ripe judgment.

The difficulties attending the order, especially its principal genus (*Potamogeton*), are by no means small, and while we advance slowly in the acquired knowledge of it, it may be trusted, that it is sure.

In another place (*) I have mentioned more particularly the geographical distribution of Dr. Morong's Monograph, and I propose to take up some other points here.

The question of hybrids has lately been much written on in Great Britain, and while it would be ridiculous to deny the existence of natural hybrids, I do not believe they are as common as asserted. Of course, those who support it have a strong position, as it

* Journal of Botany, 1893.

is exceedingly difficult to prove they are not, without years of careful work. I have myself made bees produce hybrids between *Verbascum floccosum*, and *V. Thapsus*, L., and when these hybrids flowered I found the bees showed evident preference for their flowers, over those of either parent. In *Potamogeton* I have attempted to hybridize with several species, but as yet without success. I have had plants named as continental hybrids for Britain, one of whose supposed parents does not exist as an indigenous species (or otherwise ?) in our own country; this is met by the hybrid-man by supposing that its parent did exist but has died out. Geology clearly tells us that many species did exist in many parts where they certainly are not known to exist now, so here again we have a difficulty to find an adequate answer, and the query of proof is greater still. Within easy walk of my home *Potamogeton densus*, *P. perfoliatus* and *P. crispus* grow in a mill-head, and adjacent stream in beds intermixed, yet for twenty years I have never seen a specimen that I could not refer with safety to either species. The water is in rather rapid movement, I admit, and doubtless a still ditch or pond would be more likely to produce hybrids, especially if teeming with pond-life; but the fact remains that the three species are in actual and continuous contact.

After hybrids, the question of species naturally occurs to one. No one ever has, and probably never will, be able to define what constitutes a species. Mr. H. C. Watson, in his various works on the geographical distribution of the British Flora, attacks the species maker very severely, but he owns it is because it interferes with the collation of other Floras, and with the certainty of the plants so-called being separated by other botanists, and so leading to errors in recorded distribution. The difference between a species of Bentham, and one of Gandoger is very great, and while the one overlooks natural distinctions, the other creates impossible differences. Looking through Dr. Morong's Monograph with these matters before one, what seems to present itself, is; that in the other genera, such as *Ruppia*, and *Zannichellia*, Dr. Morong is less given to divide than in *Potamogeton*, yet if we carefully contrast the characters of *P. pectinatus*, and *P. latifolius*, Morong, they seem less striking than those between some of the above named two genera.

We miss "*P. plantagineus*, Du Croz, var. *Jamaicensis*," Griseb. which occurs in St. Domingo, and Hog Island, Bahamas fide Baker in Herb. Kew. I have not seen this variety in fruit, though the general habit and texture of leaves are certainly like Du Croz, plant, which, however, must bear the name of *P. coloratus*, Hornm. (1813).

P. occidentalis, Sieb., *P. fluitans*, Griseb, is another not named, occurring in Porto Rico; St. Domingo, Jamaica, Martinique and Cuba.

Dr. Morong considers me in error in saying "I believe *P. Nuttallii*, Cham., to be *P. Oakesianus*, Robbins." Perhaps he is right, but I have never yet been able to trace the specimen on which Chamisso founded the species.

The query as to the name *P. Claytonii*, Tuck., must bear will, I think, be disposed of by its being hereafter found that it is represented by *P. ephydrum*, Rafinesque (1808); if so, this will long antedate any other name.

I am thoroughly in accord with the writer in retaining at present Tuckerman's *P. lonchites*. It has yet to be shown what the two or three? forms passing under the name of *P. fluitans*, Roth, in Europe represent; and though a certain amount of feeling has been imparted into the *fluitans* discussion, this neither helps on the truth or theme; only patient work will elucidate these difficulties. But in the next, *P. Faxoni*, I cannot agree with Dr. Morong. Certainly different plants have been distributed, with but two specimens seen by me, and on which I grounded the opinion quoted by Dr. Morong, the upper leaves might well have been taken off *P. Claytonii*, and the leaves were about identical with Irish specimens of *rufescens;* while later specimens I am unable to seperate from *lonchites*.

The hybrid difficulty is well shown by *P. spathulæformis*, Morong. Here what certainly seems a certain amount of injustice to Dr. Morong comes in, because the mere fact of publication by Mr. Fryer of Dr. Morong's herbarium name of *P. varians* constitutes the name of the plant without doubt, if recognized as a species, and we must write *P. varians*, Fryer.

As to *P. Illinoensis*, I quite agree with Mr. Fryer in joining this to the *lucens* group, in contradiction to Dr. Tiselius, who puts it to *P.* (*fluitans*) *lonchites*.

The very puzzling specimens from Wenham Pond, Mass., would, I think, be placed to *P. undulatus*, Wolfgang (*P. perfoliatus* × *crispus*, according to Mr. Fryer); but here comes in a very important question: supposing this to be an admitted fact, and also admitting that *P. crispus*, L., is an introduced plant to U. S. A., then the Wenham plant must be a very recent production of hybridity; the plant will well bear careful study.

It would be a matter of some interest to trace back to the earliest date possible the specimens of *P. crispus* gathered in North America; my friend, N. C. Melvill, has a specimen from "Philadelphia, 1841–2," gathered by "Gavin, Wakon and Kilvington." In marking a map of the world (on Mercator's projection) with the localities of *P. crispus*, it will at once be seen that, leaving the United States localities out, all fall within the right hand side of the 10° of west longitude. On the one hand, the British Isles seem the nearest to North America; on the other, Queensland in Australia. I have not seen it from New Zealand. It is certainly the most likely species to become transported to other lands, by its hardened winter-buds, which will equally bear exposure on dry mud or being frozen in ice. My friend, Mr. Straher, informs me that he finds that wherever horses have access to ponds there *P. crispus* is found, but where they are fenced round and not accessible to them, he has never found it; this is the result of the examination of a large number of ponds in Surrey. I cannot myself say I have ever noticed this, and it should be verified over a larger extent of country.

Dr. Morong makes the *P. pusillus*, var. *major*, Fries, into a species, under the name of *P. major* (Fries) Morong. To this I cannot assent, as there is already an undoubted specific name in *P. Friesii*, Ruprecht, of which I have seen numerous specimens from Ruprecht's own hand. I cannot say that I see the need of dropping *P. hybridus*, Michx., because Pentagna (not Thuillier), in Inst. Bot. 2, p. 289, 1787, so named a plant which is not Michaux's.

P. pectinatus, L., and its allied species, or what we choose to call them, will give plenty of work to botanists for some time.

Applying Dr. Morong's own test, his name *P. latifolius* is not admissible, as Robbins overlooked that there was already a *P. pectinatus*, var. *latifolius*, Meyer, Ch. Hann (1836), therefore his name

could not be admitted, and being an error at first must not be reproduced.

There are some forms of *pectinatus* that the author has not entered, *i. e.*: *P. tenuifolius*, H. B. K., "New Mexico;" *P. angustissimus*, H. B. K., "Mexico," and *P. vaginatus*, Turcz., "Saskatchewan, Bourgeau, 1858." *

Doubtless the genera *Ruppia* and *Zannichellia* will bear further study the world over. Under *Zostera* there is another innovation in nomenclature that we cannot pass by. If Dr. Morong in 1886 was uncertain of the rank his *Z. latifolia* should bear, and he does not feel certain until 1893 of its specific rank (or anyhow has not published so), then I maintain that Watson's *Z. Pacifica* (1891) must take precedence.

Lastly, but not leastly, are the plates to be named; how they were done, and the Monograph produced at the price is a puzzle only our good friends themselves can solve.

That they will be of immense use in America especially, goes without saying; the large majority of them are characteristic of the forms they represent; to me, the least so, is that of *P. confervoides*, Reich. (*P. Tuckermanni*, Robbins). Doubtless Dr. Morong meant them to be popular (I mean in the scientific sense, not paste and scissors one), and they fully bear out these requirements. I warmly congratulate my good friend on this publication, and trust that at no distant date a second edition may be called for, and if so, we in Europe will do our best to help its author. The domain of science is the seeking of truth; and petty jealousies are the most miserable outcome possible of it—this all who love nature for herself should ignore.

ARTHUR BENNETT.

Newfoundland and Labrador Plants. A. C. Waghorne (pp 3. 1893).

This is a prospectus of sets of plants collected by Rev. Mr. Waghorne in Newfoundland and on the Labrador, and now offered for sale. A list of the species of *Sphagnum* is appended. His address is New Harbor, Newfoundland.

Notes on Canadian Bryology. N. C. Kindberg (Ottawa Nat. vii. 17-23). *Andræa sparsifolia*, Zett. var. *sublævis*, *Dicranoweisia obliqua*, *Dicranella polaris*, *D. cerviculatula*, *Leptotrichum tomen-*

* Kihlman in Bot. Notiser, p. 85 (1887).

tosum, *Racomitrium fasciculare*, Brid. var. *haplocladon*, *Mnium glabrescens*, *Leskea Moseri*, *Anomodon platyphyllus*, *Pseudoleskea atricha*, *Thuidium pseudo-abietinum*, *Th. abietinum pachycladon*, *Isothecium myosuroides brevinerve*, and *I. hylocomioides*, *Eurhynchium subscabridum*, *E. subintegrifolium*, *E. Revelstokense*, *E. serrulatum cricense*, and *E. hispidifolium*, *E. pseudoserrulatum*, *Raphidostegium pseudorecurvans*, and *Hypnum Alaskæ* are described as new.

Notes on Mexican Travel i. ii. iii. C. G. Pringle (Gard. & For. vi. 172, 182, 203).

Notes on North American Trees, xxx. C. S. S. (Gard. & For. vi. 130).

The author claims *Anamonis dichotoma* as the older specific name for the tree known as *Anamonis punctata*.

Notes on the Hardwood Trees of Illinois. *J. Schneck* (Hardwood iii. No. 6).

Notes on the Staten Island Flora. Wm. T. Davis (Proc. Nat. Sci. Assoc. Staten Island, April 8, 1893).

Nouvelle Note sur l'Aciachne. H. Baillon (Bull. Mens. Soc. Linn. Paris, i. 1073).

Novitates occidentales—II. Edw. L. Greene (Erythea, i. 105–107). *Lathyrus violaceus*, *L. lætiflorus*, *Tellima tripartita*, *Tissa Talinum* and *T. valida* are characterized as new.

Passiflora cærulea.—The Tendrils of. D. T. MacDougal (Bot. Gaz. xviii. 123–129).

This is the second part of the paper, continued from the same journal, vol. xvii. p. 205).

Quercus macrocarpa—The over-cup Oak. J. T. Rothrock (Forest Leaves, iv. 22, illustrated).

Ranunculaceæ—A Comparative Study of the Roots of. Fred. B. Maywell (Bot. Gaz. xviii. 97, cont. from p. 47 with two plates).

Rhipsalis—Beschreibungen neuer Arten der Gattung. K. Schumann (Monats. Kakteenk. iii. 33).

Rhodochytrium, nov. gen. Eine Uebergangsform von den Protococcaceen zu den Chytridiaceen. G. A. Lagerheim (Bot. Zeit. ii. 43, with one plate).

Rytidosperma—Sur le. H. Baillon (Bull. Mens. Soc. Linn. Paris, i. 1088).

Salix balsamifera. O. A. Farwell (Gard. and For. vi. 149).

Segregation of Trees—On the Local. Robert Ridgway (Gard. and For. vi. 148).

Solanum nigrum. L.—Sulle forme di. A. Goiran. (Bull. Soc. Bot. Ital. 1893, 180).

Southern Appalachian Hardwoods. III. H. B. Wetzell (Hardwood, iii. Nos. 5, 6).

Spore—The Limitation of the Term. Conway MacMillan (Bot. Gaz. xviii. 130–134).

Table Mountain Pine—The. Thos. C. Porter (Gard. and For. vi. 204). Note on the distribution of *Pinus pungens.*

Tæniopteroid Fern and its Allies—A New. David White (Bull. Geol. Soc. Am. iv. 119–132, pl. 1).

A new species, *Tæniopteris Missouriensis*, from the Lower Coal Measures of the Carboniferous in Henry Co., Mo., is described and figured, with notes on its probable generic and specific allies, and a diagramatic presentation of the supposed genæology and relations of the group, beginning with the Lower Devonian *Megalopteris* and terminating, in its greatest extension, with *Danæa* in the Jurassic. It appears to be intermediate in its characters between *Tæniopteris* and *Alethopteris*. A. H.

Thuidium intermedium, Philibert (Revue Bryologique, xx. 33, 1893).

Six pages are devoted to the group of *Thuidium tamariscinum* including *T. delicatulum*, *T. recognitum*, and a new species, *T. intermedium*, characterized by revolute leaf margins like *T. delicatulum*, with the veins of the stem-leaves disappearing in the middle of the leaf, the terminal cell papillose, as in our two American species, the perichætium not ciliate as in *T. recognitum*, and the annulus persistent, of indistinct, small, square cells as in *T. tamariscinum.* An excellent key accompanies the description. E. G. B.

Tillandsia angusta der Flora Fluminensis—Die. Fritz Müller (Ber. Deutsch. Bot. Gesell. x. 447–451).

A description of this Brazilian plant referred by Mez to the genus *Hohenbergia.*

Trematocarpus—Ueber der Gattung. A. Zahlbruckner (Verh. k. k. zoöl.-bot. Gesell. Wien, xliii. Sitzungs. 6, 7).

Trichopila sanguinolenta (Bot. Mag. t. 7281). Native of Equador.

Trichophilus Neniæ eine neue epizoische Alge. G. de Lagerheim (Ber. Deutsch. Bot. Gesell. x. 514–517).

Vegetation of Hot Springs. J. Christian Bay (Bot. Gaz. xviii. 187–189).

Vegetation of the Summit of Mount Hamilton. Edw. L. Greene (Erythea, i. 77–97).

A list of 212 species collected and observed about the Lick Observatory. Prof. Greene refers *Gomphocarpus tomentosus*, A. Gray, to *Asclepias* as *A. Californica*, and makes several other changes in nomenclature. The enumeration abounds in critical notes.

White Variety of the Fireweed. A. F. Winn (Can. Record Sci. v. 300).

Note on *Epilobium spicatum* forma *canescens*.

Umbelliferæ—Studies in Californian. II. W. L. Jepson (Erythea, i. 62, 63).

Yuccas and their Pollination—Further Studies of. Wm. Trelease (4th Ann. Rep. Missouri Bot. Gard. 181–226; twenty-three plates).

Record of a large number of observations on various species, supplementary to the work of Dr. Engelmann and Prof. Riley. The name *Y. glauca*, Nutt in Frazer's Cat. (1813) is adopted in place of *Y. angustifolia*, Pursh (1814).

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No. 2. *Cerastium arvense*, L., and its North American Varieties. By Arthur Hollick and N. L. Britton (1887). (Out of print.)

No. 3. Plant Notes from Temiscouata County, Canada. By J. I. Northrop (1887). (Out of print.)

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